IV. *Notes on Fig Insects, including descriptions of three new species and a new Blastophagine genus.* By James Waterston, B.D., B.Sc.

[Read February 4th, 1920.]

The Imperial Bureau of Entomology has recently received a small consignment of Fig Insects from Uganda, collected by Dr. G. D. H. Carpenter. In working out these and other insects of the same family, already in the collections of the Bureau, I have made some notes which seem worth recording with the descriptions of the new species. Not the least interesting occurrence is that of *Blastophaga psenes* L. at Pretoria in 1919. One would like to know whether the species has been deliberately introduced or whether it has arrived more fortuitously.

Blastophaginae.

Blastophaga psenes L.

Cynips psenes Linné, Syst. Nat., p. 554 (1758).

Transvaal, Pretoria, 28.xi.1919. 3 ♀♀.

Compared with specimens from Montpellier (S. France) the above examples have the apical joint of the club a little shorter, and there are some minute differences in chaetotaxy which appear to be well within the range of variation shown in this species.

Blastophaga allotriozoonoides Grnd.

Blastophaga allotriozoonoides Grandi, Boll. Lab. Zool. Portici, x, p. 128 (1916).

Kabete, 27.vi.18. ♀ "Taken on coffee."

In this example the first joint of the mid tarsus is $\frac{1}{4}$ longer than the 2nd. In the head the length (depth) and width are sub-equal. The 2nd joint of the antenna is distinctly longer than wide. I have therefore assigned it to *B. allotriozoonoides* Grnd., though the shape of the scape does not quite tally with Grandi's figure (Bull. Soc. Ent. Ital., xviii, fig. 1, p. 6, 1917).

Genus Pegoscapus Cam. (1906).

Pegoscapus Cameron, Ann. Estacion Centr. Agronom de Cuba, p. 275 (1906).
Genotype *P. longiceps* Cam., *loc. cit.*, p. 276.

In "Genera Insectorum," 97, p. 386, 1909, Schmiedeknecht places this genus in the Spalangiini (Pteromalinae), but an examination of Cameron's material proves *Pegoscapus* to be a true Blastophagine. I have not had access to the original description, and cannot tell whether Schmiedeknecht has merely followed Cameron's opinion or puts forward his own views. The British Museum possesses two ♀ examples of *P. longiceps* labelled—

(*a*) "Cuba, ex Cameron Coll.," acquired in 1906.
(*b*) "Cuba, Havana, Baker, No. 3182, ex Cameron Coll. Type," acquired in 1914.

These specimens are specifically identical. The head is wanting in the type, but has fortunately been preserved in the co-type. The neuration is peculiar, being coloured up to the origin of the stigmal vein, beyond which is only a short hyaline stump along the costa, *i. e.* the postmarginal is practically, and without careful examination appears to be entirely, wanting. In this respect *Pegoscapus* Cam., approaches *Eiseniella* Ashm. (Proc. Wash. Ent. Soc., vol. 8, p. 31, 1906), which is a n.n. for *Eisenia* Ashm. (*nec* Malm. 1877) (Mem. Carn. Mus., 1, No. 4, p. 233, 1904). Should further investigation prove the identity of *Eiseniella* Ashm., and *Pegoscapus* * Cam., the former name will probably have priority, as it appeared on 13th July, while Cameron's paper presumably was not published till the end of the year.

The species next to be described is so remarkable that a new genus seems necessary for its reception. For this the name *Liporrhopalum*, gen. nov., is here proposed. Like *Blastophaga* Grav., *Liporrhopalum* has small circular abdominal spiracles, and the striae on the under surface of the mandibles and their appendages simple. There is a further agreement between the genera in the basal joints (1–5) of the antenna, but from the 6th joint to the end these organs in *Liporrhopalum* show affinity only with the genus *Agaon* Dalm. The neuration is unique, and in this respect *Liporrhopalum* has no close relation except with *Eupristina*

* cf. also *Valentinella* Grandi, Boll. Lab. Portici, xiii, p. 25 (1919).

Saund. In the latter, however, the only well-defined nervure is the submarginal, which ends in an indefinite club with 3 clear pustules, remote from the costa, towards which a linear thickening of the wing membrane stretches. This thickening is doubtless the obsolescent base of the marginal vein. In *Liporrhopalum* there is a single pustule towards the end of the submarginal, but the neuration is normal except that the radius is entirely wanting. The extreme tip of the neuration is abruptly thinned.

If the minute 4th antennal joint of this insect were overlooked, the antennal formula might be confused with that of the monotypic *Platyscapus* Motsch. (Bull. Soc. Nat. Moscou, vol. 36, p. 47, 1863), which was described from Ceylon and may be a Fig Insect. In his account of *P. frontalis* (*ib.*, p. 48, t. 2, f. 6), however, Motschulsky notes the presence of a short radius in the wings, and in the figure the funicle appears to be distally tumescent.

Liporrhopalum gen. nov. (Fig. 1.)

Head short, eyes large, sparsely subpilose. Antenna; scape broad and stout. Funicle slender, the joints from the 6th onwards several times as long as broad. Club long, cylindrical, not wider than the rest of the funicle. Sensoria short produced into long tubular processes. Thorax normal. Wings densely clothed with cilia. Neuration continued on to the costa, after a single pustule at the origin of the marginal. No stigmal vein. Spiracles small. Abdominal tergites not incised posteriorly.

Genotype the following species.

Liporrhopalum rutherfordi, sp. n.

A black or blackish-brown species, only the tarsi and mid tibiae paler. Wings hyaline.

Head between $\frac{1}{2}$ and $\frac{3}{4}$ broader than deep. Eye extending to half the depth. Antenna (fig. 1*a*) about 1 mm. long. Scape and bulla fused, broader than long (4 : 3). Apex of the former rounded, angulate above the pedicel, 4th joint minute and transverse (11 : 9), nearly completely hidden by the base of the horn-like process on the 3rd joint (fig. 1*b*). Sensoria on 5th joint of normal long Blastophagine type with short distal angular projections. Thereafter they are short with tubular processes. Relative lengths of the succeeding joints, 14 : 10 : 13 : 13 : 17, with an average breadth of 3. Both antennae are broken after the 5th. The last joint is

probably a fusion of two. If not, one joint may be missing. The apical sense organ shows a number of scale-like bristles disposed as in fig. 1*c*. Mandibular appendage short (measured along the inner edge sub-equal to the mandible along the outer edge), with 4 laminar ridges. On the under surface of the mandible between the ridge from the inner ventral tooth and the posterior edge there is only one median ridge. Pronotum undivided. Parapsides on

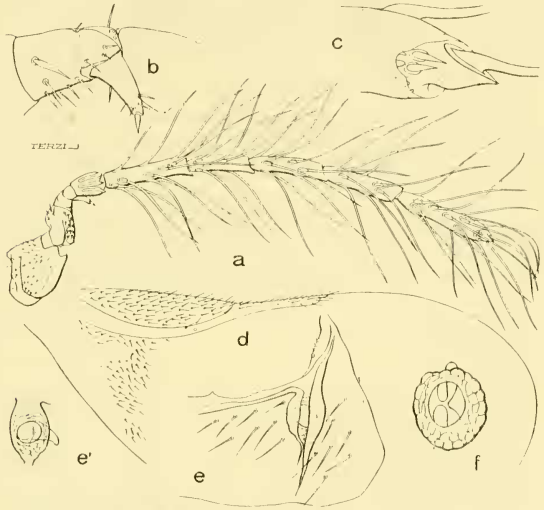

FIG. 1.—*Liporrhopalum rutherfordi* Wtst. ♀. (*a*) Antenna, (*b*) third joint of the same, (*c*) terminal sense organ, (*d*) fore-wing, (*e*) right side of propodeon flattened (dorsal and pleural aspects) showing partially covered spiracle, (*e'*) propodeal spiracle uncovered, (*f*) abdominal spiracle —6th tergite, on twice the scale of *e*.

outer half 7–9 bristles. Scutellum broadly overhanging. Metanotum 3–4 bristles on each side. Propodeon (fig. 1*e*).

Wings. Fore-wings (fig. 1*d*). Length 1·2 mm., breadth ·6 mm. The neuration extends to ·75 mm. from the radix. Rather over the distal $\frac{1}{3}$ (marginal + postmarginal) lies on the costa. Whole surface of wing densely pilose including the subcostal cell. Hind-wing length ·75 mm., breadth ·14 mm.

Legs. Apex of fore tibiae externally tridentate above, the corresponding ventral prolongation tridentate—the upper tooth

marginate. Apical spur simple, straight, more than half as long as the tibia. On the 1st tarsal joint posteriorly are 4–5 short stout bristles in a subventral row with as many more above. At the apex of the hind tibia ventrally on outer aspect are three connected curved teeth, the most ventral largest and covering the short peg-like spur. 1st hind tarsal joint ventrally gently excised and thinned on basal $\frac{2}{3}$. In the fore and hind tarsi the 2nd and 3rd joints are equal; in the mid tarsus the 3rd exceeds the 2nd by $\frac{1}{5}$. In the fore tarsus the 1st joint is $\frac{1}{2}$ longer than the 2nd; in the mid tarsus the first joint slightly exceeds the second and equals the third; in the hind tarsus the first joint is $2\frac{3}{4}$ the second.

Abdomen. Tergites 1–4 and again 5 and 6 are sub-equal, the latter distinctly shorter than the former. The receptaculum is globular and strongly chitinised. Spiracle small circular (fig. 1*f*), 7th tergite chitinised not membranous, stylet short broader than long, apically rounded with two long apical bristles and one at the side. Ovipositor about $\frac{1}{4}$ the abdomen, sheath with 8 bristles on apical half. Apex of saw with one rather strong tooth. 5th sternite not cultriform but rounded, truncated distally, with narrow central process.

Length, over 1·5 mm.

Alar expanse, about 2·75 mm.

Type ♀ in Brit. Mus.

Ceylon, Peradeniya. "On laboratory table," 1.viii. 1913. (A. Rutherford.)

Named in honour of its collector the late Government Entomologist at Peradeniya.

Although the following species is well marked, I feel a little doubt as to its generic position, owing to the incomplete state of the material available. All the specimens are dealated, and in none is an antenna complete beyond the 6th joint. While this does not prevent the drawing up of a reliable diagnosis a study of the wings and last segments of the antenna might have given additional clues to the generic placing of this form. From typical *Agaon* the new species differs only in having but one major tooth on the mandible. The head is also somewhat short. On the other hand, the antenna (fig. 2*b*) so far as it goes is exactly that of *Agaon* and of no other Blastophagine genus. Another slight but important character is the presence of a row of bristles (4) along the stipes and the absence of a palp-like splint. *A. scobiniferum*, sp. n., may

be known at once by the short and broad mandibular appendage.

Agaon scobiniferum, sp. n.

Head (fig. 2*a*) much longer than wide, across the eyes (5 : 4), at the mouth edge (2 : 1), about equal to the thorax up to the hind edge of the scutellum or to $\frac{2}{3}$ of the entire thorax and propodeon. Eyes small, prominent, occupying $\frac{1}{3}$ of the depth and separated by $\frac{3}{4}$ the greatest width of the head. Toruli set at $\frac{2}{3}$ from the base

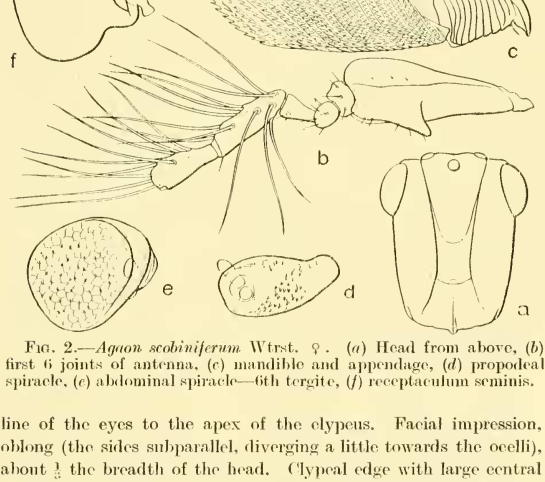

Fig. 2.—*Agaon scobiniferum* Wtrst. ♀. (*a*) Head from above, (*b*) first 6 joints of antenna, (*c*) mandible and appendage, (*d*) propodeal spiracle, (*e*) abdominal spiracle—6th tergite, (*f*) receptaculum seminis.

line of the eyes to the apex of the clypeus. Facial impression, oblong (the sides subparallel, diverging a little towards the ocelli), about $\frac{1}{3}$ the breadth of the head. Clypeal edge with large central tooth-like lobe flanked on each side by 2 bristles with 2 pairs of approximated bristles medianly set before $\frac{1}{2}$ towards the toruli. Mandibles (fig. 2*c*) with one apical tooth and (ventrally) 10–12 ridges. The serrated appendage a little more than twice as long as broad with about 20 rows of saws containing 20–30 teeth. Stipes (5 : 1) with 4, galea 3, labium 2, bristles.

Thorax. Pronotum short, transverse, broadly and deeply emarginate anteriorly, in two narrowly separated tergites which are broadly free and heavily chitinised posteriorly. Spiracle lateral,

projecting, emargination shallow. Mesonotum; scutum, with two minute widely separated bristles in front of the suture, $\frac{1}{4}$ longer than the scutellum, which is bare anteriorly and laterally, with 8–10 minute bristles in the posterior quadrant. Metanotum with three bristles at each side. Mesosternum proper sharply separated from the mesopleurae. The episternal portion of the latter intumescent, defined by an oval in-crassation which coalesces ventrally with that limiting the sternum. Epimeron large with 4–5 minute bristles at its anteroventral angle.

Legs. Fore coxae practically bare except on the thin chitinous ridge (along the inner surface of apposition), which is clothed throughout its length with dense soft bristles. Femur only $\frac{1}{6}$ longer than the coxa. Tibia, to the end of the dorsal apical tooth, $\frac{1}{2}$ the femur. Posteriorly the 1st tarsal joint bears 7 stout bristles, the 2nd and 3rd 3 each, the 4th 2, the 5th bare. All five have 1 fine apical dorsal bristle and a number of thin spinose processes on the plantar aspect. In the hind-leg the tibia is remarkable for its length and shape, being shorter than the femur and spatulate in profile. The dorsal and ventral edges alike convex, no definite apical ventral angle. There is only one stout tooth-like spine at this angle. In the fore tarsus the proportions of the 1st three joints are 65 : 52 : 52 (in *A. fasciatum* Waterst., 65 : 17 : 34); in the mid tarsus the 3rd joint is relatively longer, and in the hind tarsus shorter than in *A. fasciatum*.

Abdomen. All tergites 1–6 are slit shortly at the middle of the posterior margin, the 1st, which is as strongly chitinised as the others, at the sides as well. The ovipositor is a little shorter than the abdomen. Stylet short and broad with 4 long bristles. Spiracle moderate, broadly oval (fig. 2*e*).

Length, about $2\frac{1}{4}$ mm.; ovipositor, about ·8 mm.

Type ♀ in B. M.

One of a series from Uganda, L. Victoria, on Marida Is. (a very small island south of Wema Is. in the chain between Entebbe and Jinja), in fruit of *Ficus lukanda* Welw., 1919 (*Dr. G. D. H. Carpenter*).

Sycophaginae.

Genus Seres Wtrst. (1919).

Seres Waterston, Ent. Mo. Mag. 3rd Ser. No. 60, p. 275. Dec. 1919.

Genotype *S. armipes* Wtrst., *loc. cit.*, p. 276.

Seres levis, sp. n.

This is a smaller, duller and less metallic form than the genotype, with slightly paler legs, the mid tibiae, *e.g.*, being only faintly embrowned dorsally. Both mandibles (fig. 3*e*) are here tridentate. The funicular joints are relatively broader, the second hardly exceeding the others. The general shape of the head is the same in *levis* and *armipes*, but the proportions are strikingly different (see fig. 3). *S. levis*, sp. n., is less specialised than the genotype, as may be seen in its larger and more normal fore tibia and the longer eye, whose base line extends

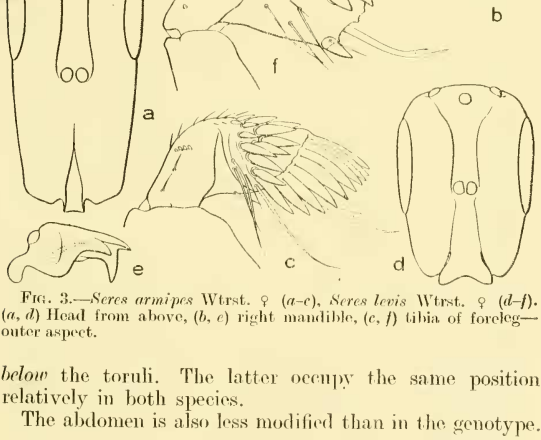

Fig. 3.—*Seres armipes* Wtrst. ♀ (*a–c*), *Seres levis* Wtrst. ♀ (*d–f*). (*a*, *d*) Head from above, (*b*, *c*) right mandible, (*e*, *f*) tibia of foreleg—outer aspect.

below the toruli. The latter occupy the same position relatively in both species.

The abdomen is also less modified than in the genotype.

Head, length ·75 mm., longer than broad (fig. 3*d*), across the eyes 3 : 2 and at the base line of lobes flanking the clypeus 2 : 1. Eyes fully half as long as the head. Toruli well *above* the base line of the eyes, otherwise in the same relative position as in the genotype. Lateral lobes inconspicuous, their sides converging, clypeal projection short, very broad and deeply and evenly emarginate, with a row of bristles (7–9) above and many others scattered irregularly up to the level of the toruli. Antenna ·75 mm. Scape

(6 : 1). Pedicel (2 : 1). Funicle not conspicuously dilated. First three joints of equal length (9), the 4th a trifle longer (10), club in ratio 11 : 9 : 10. The joints of funicle and club are of practically equal breadth (12), the second funicular, a little broader (13). Maxillary palpus 14 : 7 : 7, width of 1st joint at apex 6, terminal bristle twice the supporting joint. Labial palpus 10 : 9. Apical bristle equal to that of the maxillary palpus.

Thorax and Propodeon 1 mm. in length. Pronotum quadrate with anteriorly convergent sides, over half as long as the combined scutum and scutellum. Parapsidal and axillary sutures interstitial. Scutellum with 4 bristles one at each side posteriorly on the axillary suture and another at the hind edge. Metapleurae striate reticulate with about a dozen minute bristles between the edge and the spiracle.

Wings. Fore-wings, length 1·4 mm., breadth ·6 mm., 5 bristles on submarginal. On marginal + postmarginal there are at the edge and on the surface about a dozen bristles besides the solitary one at the base of the radius. Discal ciliation a little denser and darker than in the genotype. Hind-wings (19 : 5). Length 1·1 mm.

Fore-legs. Femur (fig. 3*f*) more elongate (7 : 2) than in *S. armipes*, ventral edge straight, dorsally convex. Tibia with only 3 peg-like spines, 1 at apex ventrally and 2 dorsally. Tarsus, first three joints as in *armipes*. Mid- and Hind-legs. In the mid tarsus the first and second joints are in ratio 5 : 4 (*armipes* 5 : 3), and in the hind tarsus these two joints are sub-equal (*armipes* 5 : 4). Second hind-tibial spur $\frac{2}{5}$ of the first.

Abdomen + ovipositor over 1·4 mm. The ovipositor about ·25 mm. Tergites 1 and 4 are longest and sub-equal and about $\frac{1}{4}$ longer than 2, which is shortest; 3, 5 and 6 are equal, slightly exceeding 2. Tergites 1–4 show three, and tergite 5 one, slits posteriorly. The deepest slit on tergite 1 extending to $\frac{1}{4}$. Spiracle minute, circular, its diameter $\frac{2}{5}$ the length of the stylet (much larger in *S. armipes*, the diameter $1\frac{3}{4}$ as long as the stylet). Tergite 6 with median row of 4 bristles (2, 2) and a patch of bristles (10–12) on the inner side of each spiracle, 1–2 of the bristles being longer than the others.

Length, about 3 mm.; alar expanse, 4·6 mm.

Type ♀ in B. M.

One of a series from Uganda, L. Victoria, on Marida Is. (a very small island south of Wema Is. in the chain between Entebbe and Jinja), in fruit of *Ficus lukanda* Welw., 1919. (*Dr. G. D. H. Carpenter.*)